CORE STATES GROUP

July 1, 2020

Sustainability Department
The Town of Concord
Concord, MA 01742

Re: Sustainability Memo
Chase Bank
1134 Main Street
Concord, MA 01742

Dear Ms. Hanley:

This letter is in regards to the sustainability memo received for the proposed Chase Bank. The HVAC system does consist of gas-fired rooftop units (RTU) for heating. Due to the regional climate of the proposed project the winter design temperature is very cold at 8°F. At this low of a temperature, natural gas-fired mechanical units are proposed to ensure occupancy comfort is achieved. The specified mechanical units combustion efficiencies meet energy code requirements. Furthermore, even with natural gas producing emissions during the combustion process, the gas-fired units will operate less as it is easier to achieve the design setpoint. Whereas units that would use electric heating would need to run longer to keep the temperature. Finally, the gas-fired unit heaters can be specified with the Low NOx heat exchanger where nitrous oxide emissions are reduced.

The Mechanical, Electrical, and Plumbing systems proposed within this project contain other sustainable energy provisions. The specified RTU's are manufactured by Carrier and include their latest EcoBlue technology. These units use direct-drive motor and high efficiency two-stage compressors that exceed energy code requirements. The plumbing fixtures are low-flow fixtures and meet the prerequisite requirements in the latest LEED standards. The toilets are only 1.0 gpf and the faucets utilize metered sensor faucet technology for water conservation. The water heater is electrical and abides with the local sustainable energy requirements. Finally, the electrical system utilized LED lighting all throughout the building, including the site lighting.

In conclusion, gas-fired heating is required to maintain occupant comfort in the regional climate. Fortunately, there are other sustainable energy provisions provided in the proposed Chase Bank.

Respectfully,
Steven Vaz, P.E.
Project Engineer
908.462.9916 | svaz@core-states.com

Carrier

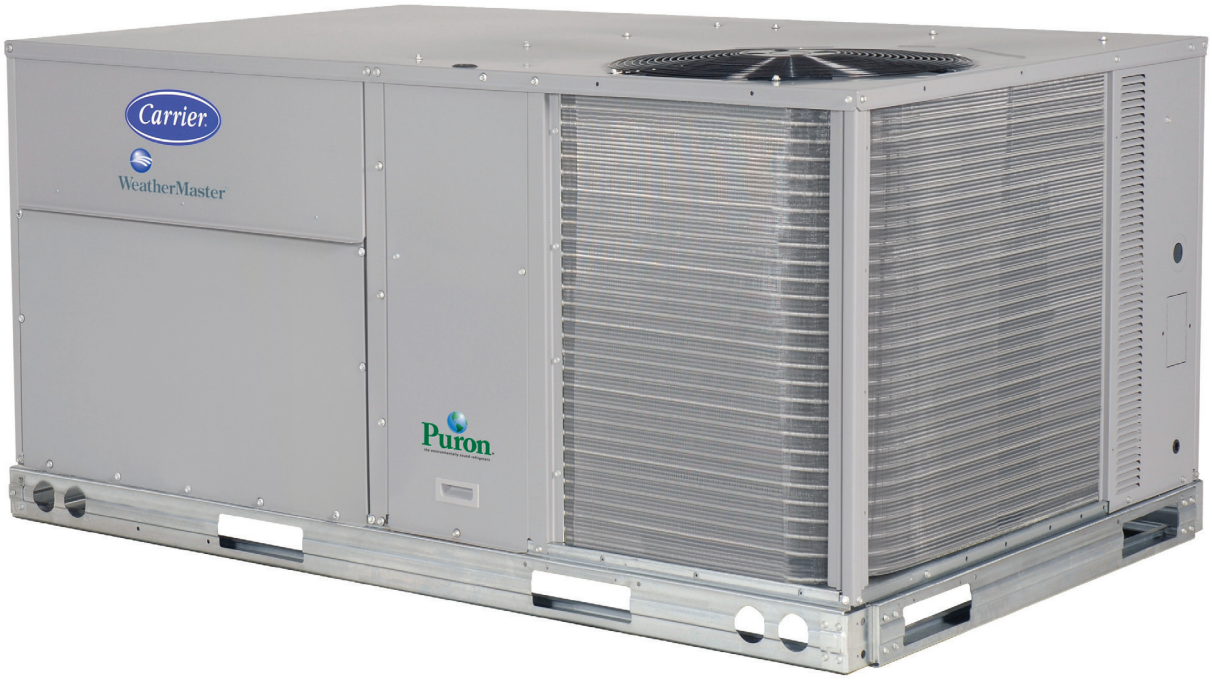
Turn to the experts

Product Data

WeatherMaster® Single Packaged Rooftop

3 to 5 Nominal Tons

ecoblue™ technology



48/50GC**04, 05, 06

48GC: Single-Package Gas Heating/Electric Cooling Rooftop Units
50GC: Electric Cooling Rooftop Units with Optional Electric Heat
with Puron® Refrigerant (R-410A)

EcoBlue Technology

Direct drive EcoBlue™ Technology indoor fan system uses Vane Axial fan design and electrically commutated motors.

This new Vane Axial design over past belt drive systems has 75% fewer moving parts, uses up to 40% less energy and has no fan belts, blower bearings and shaft.

Streamlined control and integration

Carrier controllers make connecting WeatherMaster® rooftops into existing building automation systems easy. The units are compatible with conventional thermostat controls, SystemVu™ controls and Carrier RTU Open multi-protocol controller.

Operating efficiency and flexibility

The 48/50GC rooftops exceed ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 90.1-2016, IECC[1] (International Energy Conservation Code) IECC-2018 minimum efficiency requirements.

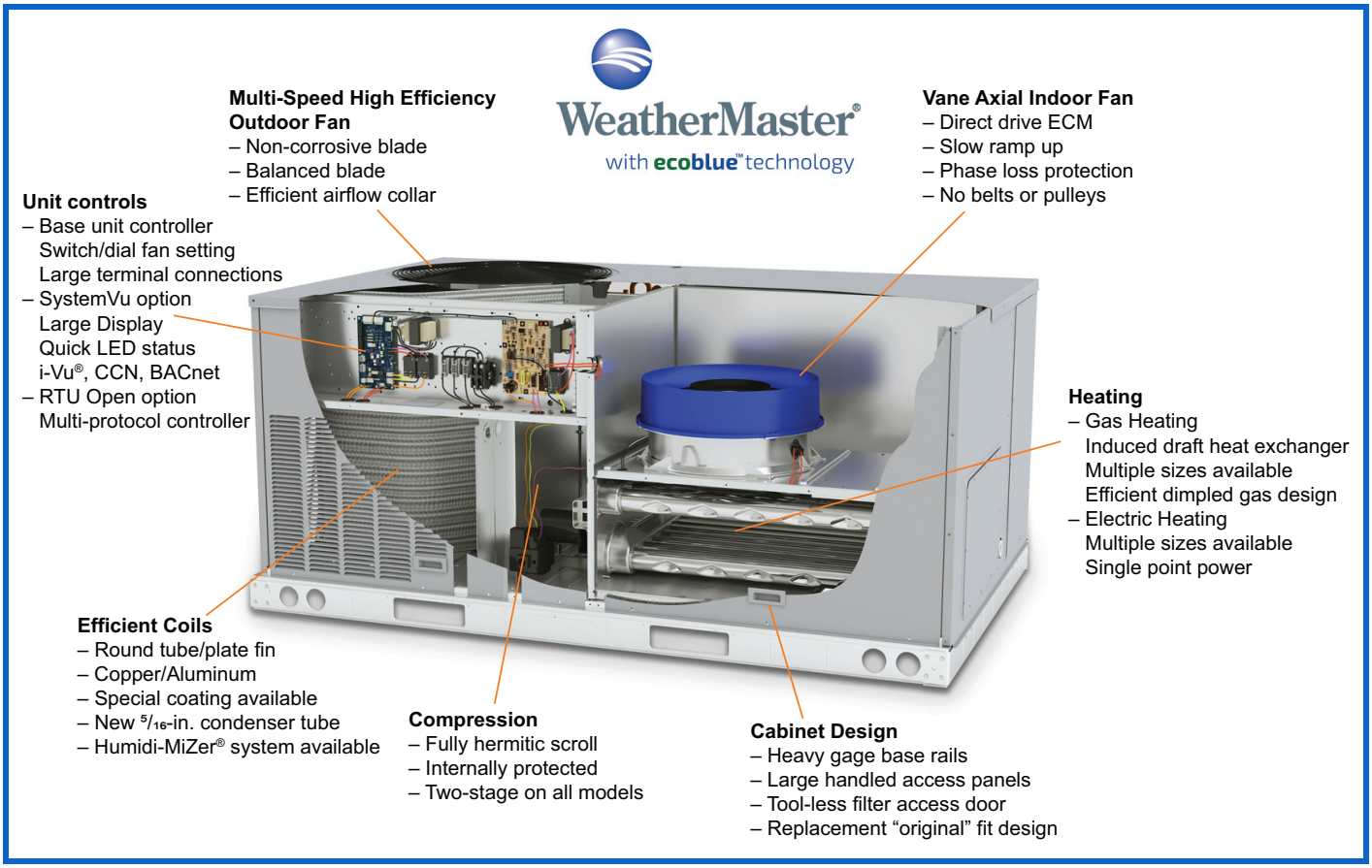
1. IECC is a registered trademark of the International Code Council, Inc.

Field convertible airflow

All WeatherMaster 3 to 5 ton units are field-convertible to horizontal airflow, which makes it easy to adjust to unexpected job-site.

Comfort control

Carrier's patented Humidi-MiZer® adaptive dehumidification system is an all-inclusive factory-installed option on gas heating/electric cooling and electric cooling/electric heat models. This system provides reliable, flexible operation to meet indoor part load sensible and latent requirements.



HEAT RATING TABLE — NATURAL GAS AND PROPANE

48GC UNIT		GAS HEAT	AL/SS HEAT EXCHANGER		TEMPERATURE RISE (°F)	THERMAL EFFICIENCY (%)	AFUE EFFICIENCY (%)
			INPUT/OUTPUT STAGE 1 (MBH)	INPUT/OUTPUT STAGE 2 (MBH)			
Single Phase	04	LOW	–/–	65/53	25-55	81	81
		MED	–/–	90/73	45-85	82	81
		HIGH	–/–	—	—	—	—
	05	LOW	–/–	65/53	20-55	81	81
		MED	–/–	90/73	30-65	82	81
		HIGH	–/–	130/106	45-80	81	81
	06	LOW	–/–	65/53	15-55	81	81
		MED	–/–	90/73	25-65	82	81
		HIGH	–/–	130/106	35-80	81	81
Three Phase	04	LOW	50/40	67/54	25-55	81	N/A
		MED	82/65	110/88	50-85	80	N/A
		HIGH	—	—	—	—	—
	05	LOW	50/40	67/54	25-55	81	N/A
		MED	82/65	110/88	35-65	80	N/A
		HIGH	120/96	150/120	50-80	80	N/A
	06	LOW	50/40	67/54	20-55	81	N/A
		MED	82/65	110/88	30-65	80	N/A
		HIGH	120/96	150/120	40-80	80	N/A

HEAT RATING TABLE — LOW NOx

48GC UNIT		GAS HEAT	AL/SS HEAT EXCHANGER		TEMPERATURE RISE (°F)	THERMAL EFFICIENCY (%)	AFUE EFFICIENCY (%)
			INPUT/OUTPUT STAGE 1 (MBH)	INPUT/OUTPUT STAGE 2 (MBH)			
Single Phase	04	LOW	—	60 / 49	20 - 50	81%	81%
	05	LOW	—	60 / 49	20 - 50	81%	81%
	06	LOW	—	60 / 49	15 - 50	81%	81%
Three Phase	04	LOW	—	60 / 49	20 - 50	81%	n/a
	05	LOW	—	60 / 49	20 - 50	81%	n/a
	06	LOW	—	60 / 49	15 - 50	81%	n/a

applicable), and compressors shall have molded composite handles.

d. Handles shall be UV modified, composite. They shall be permanently attached, and recessed into the panel.

e. Screws on the vertical portion of all removable access panel shall engage into heat resistant, molded composite collars.

f. Collars shall be removable and easily replaceable using manufacturer recommended parts.

H. (23 81 19.13.H.) Gas Heat:

1. General:

a. Heat exchanger shall be an induced draft design. Positive pressure heat exchanger designs shall not be allowed.

b. Shall incorporate a direct-spark ignition system and redundant main gas valve.

c. Gas supply pressure at the inlet to the rooftop unit gas valve must match that required by the manufacturer.

2. The heat exchanger shall be controlled by an integrated gas controller (IGC) microprocessor.

a. IGC board shall notify users of fault using an LED (light-emitting diode).

b. The LED shall be visible without removing the control box access panel.

c. IGC board shall contain algorithms that modify evaporator fan operation to prevent future cycling on high temperature limit switch.

d. Unit shall be equipped with anti-cycle protection with one short cycle on unit flame rollout switch or 4 continuous short cycles on the high temperature limit switch. Fault indication shall be made using an LED.

3. Standard Heat Exchanger construction

a. Heat exchanger shall be of the tubular-section type constructed of a minimum of 20-gage steel coated with a nominal 1.2 mil aluminum-silicone alloy for corrosion resistance.

b. Burners shall be of the in-shot type constructed of aluminum-coated steel.

c. Burners shall incorporate orifices for rated heat output up to 2000 ft (610 m) elevation. Additional accessory kits may be required for applications above 2000 ft (610 m) elevation, depending on local gas supply conditions.

d. Each heat exchanger tube shall contain multiple dimples for increased heating effectiveness.

4. Optional Stainless Steel Heat Exchanger construction:

a. Use energy saving, direct-spark ignition system.

b. Use a redundant main gas valve.

c. Burners shall be of the in-shot type constructed of aluminum-coated steel.

d. All gas piping shall enter the unit cabinet at a single location on side of unit (horizontal plane).

e. The optional stainless steel heat exchanger shall be of the tubular-section type, constructed of a minimum of 20-gage type 409 stainless steel.

f. Type 409 stainless steel shall be used in heat exchanger tubes and vestibule plate.

g. Complete stainless steel heat exchanger allows for greater application flexibility.

5. Optional Low NOx Heat Exchanger construction:

a. Low NOx reduction shall be provided to reduce nitrous oxide emissions to meet California's Air Quality Management District (SCAQMD) low-NOx emissions requirement of 40 nanograms per joule or less.

b. Primary tubes and vestibule plates on low NOx units shall be 409 stainless steel. Other components shall be aluminized steel.

6. Induced draft combustion motor and blower:

a. Shall be a direct-drive, single inlet, forward-curved centrifugal type.

b. Shall be made from steel with a corrosion resistant finish.

c. Shall have permanently lubricated sealed bearings.

d. Shall have inherent thermal overload protection.

e. Shall have an automatic reset feature.

I. (23 81 19.13.I.) Coils:

1. Standard Aluminum Fin-Copper Tube Coils:

a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.

b. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.

c. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

2. Optional Pre-coated aluminum-fin condenser coils (3 Phase Models Only):

a. Shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments.